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Contribution ID: 3151 Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) Developing the Integrating Detector Electronics Chain for the MOLLER Experiment

Monday, 6 June 2022 14:00 (15 minutes)

The MOLLER experiment, in preparation at Jefferson Laboratory, in the United States, aims to constrain physics beyond the Standard Model using parity-violating Moller scattering at 11 GeV. The parity-violating asymmetry between the cross-sections for right- and left-handed helicity beam electrons scattered from the atomic electrons in a liquid hydrogen target is expected to be 35.6 ppb and MOLLER aims for 0.73 ppb precision. The measured asymmetry will be used to determine the weak charge of the electron to a fractional accuracy of 2.3%. Among the most challenging aspects of the experiment will be the detection of the small asymmetry in the detector signal. Consequently, it is very important to decrease the noise of the detector electronics as much as possible, which requires many iterations of simulation, prototyping, and testing of detector systems. This lengthy process is also necessary to fully understand and characterize the electronics for the data analysis at the end of the experiment. This talk will focus on recent developments of the integrating detector electronics chain for the MOLLER main detector system. Specifically of interest are the results of recent beam tests and plans for future design modifications.

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